

WATERSHED WALKER II

JANUARY 2004

AQUATIC MACROINVERTEBRATE INDICATORS

Macro invertebrates that live in the streams and rivers give a good indicator of how clean the water supply may be.

The caddisfly larvae live in clean water. Most species are very sensitive to polluted water. The larvae of the caddisfly generally lives in flowing waters on the bottom surface of the habitat.

The larvae construct cylindrical cases up to 2" long from leaf or twig fragments, which they cement together in a spiral pattern. As they move about they drag the case with them, with only their front ends and legs sticking out. The larvae feed on algae, decaying plant matter and micro organisms.

The adult caddisfly is much like a small moth with hairs on the wings and long, slender antennae. The adults do not eat.



Caddisfly larvae



Caddisfly Adult

Morgan County Soil & Water
Conservation District
1324 Morgan Avenue Suite 2
Morgansville, IN 46151
765-342-5504 ext. 3

Morgan County Watershed Initiative Stage 2.

The original watershed study, "Morgan County White River Watershed Initiative" is now being followed up by Stage 2. The District hopes to implement parts of the Watershed Management Plan. Hopefully, this will be a step towards reducing e-coli in the Lambs Creek sub watershed.

The District would like to give the farmers a helping hand in leading the way in conservation practices.

One step in Stage 2 is to implement a cost share program for best management practices. Up to 75% of the cost would be provided to help implement these best management practices. These BMP's may include, but are not limited to, stream buffers, exclusionary fencing and alternative watering sources for livestock.

What river system drains more than 40 percent of the contiguous U.S., as well as portions of Southern Canada?

The Mississippi River

Woodland Management

Woodland management improves the quality and quantity of woodland growing stock and maintains ground cover and litter for soil and water conservation. Existing woodland or other suitable land is dedicated to timber production. Livestock is excluded. Optimum tree populations are determined by the kinds of trees planted and their adaptability to your soils. Existing trees or newly planted trees are thinned, pruned and harvested to maintain desired production. Twigs, limbs and other debris are not removed, maintaining ground cover, reducing soil erosion and providing wildlife habitat. As trees mature they are harvested, and replacements are established.

This helps by adding income and beauty to your farm. Ground cover provides wildlife habitat, reduces soil erosion and improves water quality.

- ◊ Plant trees that are suitable to your soils.
- ◊ Protect from grazing.
- ◊ Cut undesirable trees and shrubs that are competing with desired species for sunlight and moisture.
- ◊ Thin hardwood stands to a 12-foot spacing before trees are 5 inches in diameter at a 4 to 5 foot height.
- ◊ Thin conifer stands to a 10-foot spacing before trees are 5 inches in diameter at a 4 to 5 foot height.
- ◊ Do not cut vines unless they are interfering with trees with a high commercial value.

FILTER STRIP

A strip of grass, trees or shrubs that filters runoff and removes sediment, fertilizer, and pesticides before they reach water bodies or water sources including wells.

How it works

Strips of grass, trees and/or shrubs slow water flow and cause contaminants like sediment, pesticides, and fertilizers to collect in vegetation. Collected nutrients are used by the vegetation, rather than entering water supplies. Filtered water then enters water bodies.

How it helps

- * Grass, trees and shrubs provide cover for small birds and animals.
- * Ground cover reduces soil erosion.
- * The vegetative strip moves rowcrop operations farther from a stream.
- * Vegetation prevents contaminants from entering water bodies, protecting water quality.

Planning ahead

- * Are adequate soil conservation measures installed above filter strips?
- * Are plants adapted to your soil types?
- * Have you selected the correct species of vegetation for the control you need? For example, are you establishing the filter strip around a sinkhole, to control runoff from a feedlot or to filter runoff from cropland?

For more information contact:
SWCD 765-342-5594 ext 3

STORMWATER REGULATION CHANGES FOR INDIANA

A NEW VERSION OF 327 Indiana Administrative Code 15-5 (commonly known as Rule 5), with some significant changes, came into effect on November 26, 2003. 327 IAC 15-5, **Rule 5, is a state regulation governing storm water quality from construction activities.** The purpose of the rule is to reduce the amount of sediment and other pollutants, related to construction activities, that can enter into storm-water runoff so that public health, existing water uses and aquatic biota are protected. Many developers and contractors have referred to this regulation as the five-acre rule due to the fact that the rule focused on earth-disturbing activities that totaled five acres or more in size.

The previous version of Rule 5 required projects of five acres or more to submit an erosion and sediment control plan to the local SWCD for review and approval as well as send a Notice of Intent to the Indiana Department of Environmental Management. Once the necessary paperwork was approved the project was then required to follow the erosion control plan and was subject to periodic on-site compliance assessments.

The most noticeable change in the new version of Rule 5 is that the acreage requirement has been reduced to one (1) acre or more.

Some other notable changes include requirements for self-assessment and documentation on-site stormwater pollution controls, signage at the entrance of the projects, description of potential on-site stormwater pollutants, and design concepts for post-construction stormwater quality measures to reduce pollutants discharging from the site.

The changes to Rule 5 are just some of many changes that are underway for Indiana water quality regulations. These changes are being made in an effort to comply with federal regulations under the National Pollutant Discharge Elimination System (NPDES).

For information on the web visit:
http://www.in.gov/idem/water/npdes/permits/wetwthr_storm/rule5.html

This article was written by Jerod Chew. Jerod is a Resource Specialist for the Department of Natural Resources, Division of Soil Conservation. He directly assists land users of Brown and Johnson counties with assessing specific soil and water resource concerns and developing appropriate solutions.



FISHING IS KEEN—WHEN STREAMS ARE CLEAN

WATERSHED WALKER II

APRIL 2004

AQUATIC MACROINVERTEBRATE INDICATORS

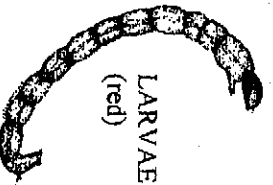
Macro invertebrates that live in the streams and rivers give a good indicator of how clean the water supply may be.

The bloodworm lives on the bottom of the stream in the mud. If midge larvae are very numerous and account for the majority of the community, that is an indication of poor environmental health caused by some type of pollution. The kinds of midge larvae that are bright red often thrive where organic wastes or nutrients dilute the water and reduce dissolved oxygen concentrations. Some types of midge larvae are very tolerant of toxic substances. They often develop deformities in their mouthparts when they live in an environment polluted with toxic substances and scientists sometimes examine these deformities as a biomonitoring technique.

ADULT

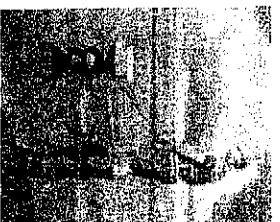


LARVAE
(red)



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National Water Research Institute
of the National Academy of Sciences
of the United States of America

WHEN YOU ARE FERTILIZING THE LAWN, RE- MEMBER YOU ARE NOT JUST FERTIL- IZING THE LAWN.



The current number one water pollution problem comes from diffuse or "nonpoint sources" like cars leaking oil, fertilizers washing off of fields, lawns, and gardens, and failing septic systems. Making small changes to ordinary activities around the home, like how you fertilize the lawn, can make a difference.

- Use fertilizers sparingly. Lawns and many plants do not need as much fertilizer or need it as often as you might think. Test your soil to be sure. Consider using organic fertilizers; they release nutrients more slowly.
- Don't fertilize before a rain storm.
- Maintain a buffer strip of unmowed natural vegetation bordering watercourses and ponds to trap excess fertilizers and sediment from lawns/gardens.
- Make your own mulch.

FARM POND

Farm pond...a pool of water formed by a dam or pit, to supply water for livestock, recreation and wildlife, and to control gully erosion.

How it works - a typical farm pond is formed by building a dam across an existing gully or low lying area. Earth for the dam is dug out above the dam with heavy machinery to form a bowl. Generally the ponded area fills with water within a year.

An overflow pipe is installed through the dam to control the water level and allow water to spill through the dam without causing erosion.

How it helps - prevents soil erosion and protects water quality by collecting and storing runoff water.

- ◊ Provides water for livestock, fish and wildlife, and recreational opportunities.
- ◊ Adds value and beauty to a farm or farmstead.
- ◊ Provides a water supply for emergencies.
- ◆ Keep outlet free of debris
- ◆ Keep burrowing animals, trees and shrubs off the dam
- ◆ Maintain grass cover on the dam.
- ◆ Divert runoff from feedlots, barnyards and septic tanks if the pond is used for drinking water, livestock, wildlife or recreation.

TAKING CARE OF YOUR SEPTIC SYSTEM

Hazardous chemicals should never be rinsed down your drain; they may kill the bacteria and micro organisms working in your septic system to break down waste.

Use garbage disposals sparingly, and avoid putting anything down the toilet or drain that will not easily break down. Solids build up in your septic tank and affect your system's ability to treat waste.

Septic tank additives are generally not beneficial; some may actually harm the system.

Fat, grease, or oil should never be rinsed down the drain.

IS YOUR SEPTIC SYSTEM FAILING?

There are several indicators that your septic system may not be functioning properly:

Slowly draining sinks and toilets

Gurgling sounds in the plumbing

Plumbing backups

Sewage odors in the house or out in the yard

The ground is wet or mushy above your absorption field

The grass is greener or grows faster above your absorption field

Tests show the presence of bacteria in nearby streams or wells

If you septic system exhibits any of these signs, contact a professional to assess the situation.

RIPARIAN BUFFERS

Definition—An area of trees and other vegetation located in areas adjoining and up gradient from surface water bodies, designed to intercept surface runoff, and sub-surface flows from upland sources prior to entry into surface waters and groundwater recharge areas.

Purposes—Create shade to lower water temperatures to improve habitat for fish and other aquatic organisms.

Provide a source of detritus and large woody debris for fish and other aquatic organisms and riparian habitat and corridors for wildlife.

Reduce excess amounts of sediment, organic material, nutrients, and pesticides and other pollutants in surface runoff and reduce excess nutrients and other chemicals in shallow groundwater flow.

Zone 1—Undisturbed Forest—The buffer will consist of a zone that begins at the normal water line, or at the upper edge of the active channel or shore, and extend a minimum distance of 15 feet, measured horizontally on a line perpendicular to the water course or water body.

Dominant vegetation will consist of existing or planted trees and shrubs suited to the site. Livestock shall be excluded as necessary to achieve and maintain the intended purpose of the riparian forest buffer.

Zone 2—Managed Forest—An additional strip or area of land, Zone 2, will begin at the edge and up-gradient of zone 1 and extend a minimum distance of 20 feet, measured horizontally on a line perpendicular to the water course or water body. The minimum combined width of Zones 1 and 2 will be 100 feet or 30% of the floodplain width whichever is less, but no buffer will be less than 35 feet wide.

Consideration—The severity of bank erosion and its influence on existing or potential riparian trees and shrubs should be assessed. Watershed-level treatment or bank stability activities may be needed before establishing a riparian forest buffer.

Favor tree and shrub species that are native and have multiple values such as those suited for time, biomass, nuts, fruit, browse, nesting, aesthetics and tolerance to locally used herbicides.

Avoid tree and shrub species that may be alternate hosts to undesirable pests or that may be considered noxious or undesirable. Species diversity should be considered to avoid loss of function due to species specific pests.

The location, layout and density of the buffer should complement natural features. Avoid layouts and locations that would concentrate flood flows or return flows. Low flexible-stemmed shrubs will minimize obstruction of local flood flows. Species selection criteria to improve aesthetics include seasonal foliage color, showy flowers and fruit, foliage texture, form and branching habit.

For providing habitat and corridors for wildlife, manage the buffer to favor food, shelter and nesting cover that would satisfy the habitat requirements of the indicator or target wildlife.

For purposes of reducing excess pollutants in surface runoff and shallow groundwater or providing habitat and corridors for wildlife manage the dominant canopy to maintain maximum vigor of overstory and understory species.

Additional operation and maintenance requirements shall be developed on a site-specific basis to assure performance of the practice as intended.

**Call the Morgan County
Soil and Water
Conservation District office
(765) 342-5594 ext 3 for
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conservation practices.**

The District would like to give the farmers a helping hand in leading the way in conservation practices.

One step in Stage 2 of the watershed project is to implement a cost share program for best management practices. Up to 75% of the cost would be provided to help implement these best management practices. These BMP's may include, but are not limited to, stream buffers, exclusionary fencing and alternative watering sources for livestock.

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JULY 2004

AQUATIC MACROINVERTEBRATE INDICATORS

Macro invertebrates that live in the streams and rivers are a good indicator of how clean the water supply may be.

Featured Aquatic Insect:

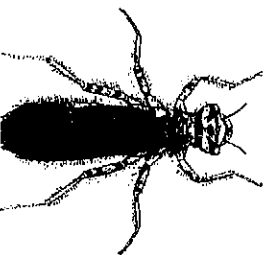
DRAGONFLY

Most everyone is familiar with the common adult dragonfly and perhaps know that it feeds on adult mosquitoes. Not so well known is the miniature form (nymph) that lives in water for up to two years. They are up to one inch long and can be found by scooping up debris under the edge of the water. They hatch from eggs laid in the water by adults and feed on mosquito larvae. Their immature wings fold over their back unlike the adult which has extended wings.

Dragonfly nymphs are among a group of macroinvertebrates which are somewhat sensitive to low oxygen levels and can tolerate only small amounts of water pollutants. High numbers of dragonflies indicate high water quality or water that is only slightly stressed.

- Bill Brenneman
Education Coordinator

Dragonfly Nymph



WHEN YOUR CAR'S LEAKING OIL ON THE STREET, REMEMBER IT'S NOT JUST LEAKING OIL ON THE STREET

What is the problem?

The current number one water pollution problem comes from diffuse or "nonpoint sources" like cars leaking oil, fertilizers washing off of fields, lawns and gardens, and failing septic systems. Making small changes to ordinary activities around the home, like how you change your vehicle's oil, can make a difference.

What can you do?

- ☞ Check your car or truck for drips and oil leaks regularly and fix them promptly. Keep your vehicle tuned to reduce oil use.
- ☞ Use ground cloths or drip pans under your vehicle if you have leaks or are doing engine work. Clean up spills immediately and properly dispose of cleanup materials.
- ☞ Collect all used oil in containers with tight fitting lids. Old plastic jugs are excellent for this purpose.
- ☞ Do not mix waste oil with gasoline, solvents or other engine fluids. This contaminates the oil which may be reused, increases the volume of the waste, and may form a more hazardous chemical.
- ☞ Never dump motor oil, antifreeze, transmission fluid or other engine fluids into road gutters, down the storm drain or catch basin, on the ground or into a ditch.

IDEM pub.

WHAT'S IN YOUR HOME?

These are just some of the household hazardous wastes found in most homes.






- 🔧 Kitchen: Aerosol cans (full), floor care products, furniture polish. Metal polish.
- 🔧 Bathrooms: Nail polish, nail polish remover.
- 🔧 Garage: Antifreeze, automotive batteries, brake fluid, car wax with solvent, diesel fuel, oil, gasoline, kerosene, metal polish with solvent, motor oil, transmission fluid, windshield washer solution
- 🔧 Workshop: paint brush cleaner with solvent, paint brush cleaner with TSP, glue (solvent based), mineral spirits, oil based paint, automotive paint, thinner, paint stripper (solvent), primer, rust remover, turpentine, varnish, wood preservative
- 🔧 Garden: Fungicide, insecticide, rat/mouse/gopher poison, weed killer
- 🔧 Here & There: Household batteries, dry cleaning solvents, fiberglass epoxy, gun cleaning solvents, lighter fluid, moth balls, unmixed photographic chemicals, septic tank degreasers, swimming pool chemicals.

Safer Alternative: Drain Opener:
To prevent clogs, pour in 1/4 cup baking soda followed by 1/2 cup vinegar. When fizzing stops, flush with boiling water.

IMPROVING SOIL QUALITY

STABILIZING STREAMBANKS


Healthy soils:

-  Supply enough water and air for plant growth.
-  Hold and release plant nutrients steadily.
-  Increase with infiltration.
-  Host a large and diverse population of soil organisms.
-  Have a loose consistency so that roots water, and equipment can pass easily.


What can you do to improve or maintain healthy soils on your farm?


-  **Manage organic matter.**
Healthy soil contains an abundance of organic matter and living organisms. Soils low in organic matter cannot perform. Practices that increase organic matter include leaving crop residues on the surface; planting or under-seeding with cover crops; choosing crop rotations that include high residue plants; applying manure or compost; using residue management practices, especially no till; and mulching.
-  **Maintain chemical balances.**
Don't overload your soil with nutrients. Practice nutrient management and maintain or achieve a desirable pH.
-  **Avoid compaction.** Excessive traffic or tillage, working soils when wet or leaving bare soil exposed to heavy rains all cause soil compaction or crusting.
-  **Conserve topsoil** Use conservation measures to control erosion and runoff.


Streambank erosion begins or increases when protective vegetation is lost, water flow in the stream channel increases or the land use adjacent to the channel changes. A common problem is over use by livestock along stream banks that brings trampling, trailing and extensive physical disturbances to vegetation on the stream bank.


 **Manage livestock access to streams and streambanks to allow vegetation to reestablish and reduce streambank erosion.**


Other bonuses: better water in the stream for fish and humans, more habitat for wildlife and better water for livestock to drink.


 **Provide off-stream watering for livestock to offer better quality drinking water and improve their health.** If the stream is the only source of livestock drinking water, establish a fenced water access ramp that protects the streambank.

 **Install a water crossing for farm equipment or livestock.** Water crossings can be designed as ford stream crossings, culvert crossings or bridges. Used with fencing, water crossings at fixed locations minimize the impact of livestock on a stream.

 **Place rock riprap on the streambank where long term durability is needed.** Riprap is stone of various sizes, placed compactly or irregularly to prevent erosion, scour or sloughing of the streambanks. Stone used for riprap should be dense and hard enough to withstand exposure to air, water and freezing temperatures.

 **Plant grass filter strips or riparian forested buffers along streambanks to remove sediment, fertilizers, pesticides and other potential contaminants from runoff.**

 **Filter strips and other buffers slow water runoff, and their root systems help hold the soil particles together to help stabilize the streambank and streamside areas.** They also provide cover for wildlife and can also enhance fish habitat.

 **Use soil bioengineering methods to plant living, woody plant materials such as willows to stabilize a streambank.** Used with other materials, soil bioengineering systems offer more permanent protection and a natural appearance. Advantages include a diverse riparian habitat, shade, organic additions to the stream, and cover for fish. The plantings can often be installed by the landowner.

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OCTOBER 2004

AQUATIC MACROINVERTEBRATE INDICATORS

Macro invertebrates that live in the streams and rivers are a good indicator of how clean the water supply may be.

Featured Aquatic Insect:

Stonefly

Adult stoneflies are yellowish, greenish, or brownish in in color. They have transparent wings, usually two pairs but seldom fly. The eggs are deposited into the water, the abundant aquatic nymphs are found under stones, hence their name. Since the gills are poorly developed, the nymphs are confined to well-aerated waters, such as fast streams, where they form one of the most important food supplies for fresh-water fish. One to three years may be required to reach the adult stage. Fishermen refer to adult stoneflies as browns and imitate their shape in lures. Some stoneflies are carnivorous, others feed on algae, bacteria and vegetable debris. They are eaten by a variety of fish species.

Stone flies indicate cleaner waters.



Adult Stone Fly

Morgan County Soil & Water
Conservation District
1126 Morton Avenue Suite 2
Mantua, IL, IN 46151
765-342-5594 ext. 5

It's Just A Little Erosion, What's the Big Deal???

With numerous construction projects occurring around Morgan County, most of us have probably driven past a construction site where mud has been tracked onto the road. In the fall and spring, you may have even noticed a farmer's tracks on the road leading from a recently plowed field. Many freshly washed cars have fallen victim to these very circumstances, but the soil on the road and on your car is just a minor inconvenience compared to the environmental effects that can occur from bare soil conditions.

When soils are left bare or without cover, such as grass or corn stubble, they are very prone to erosion. Erosion is the detachment of soil particles from the land surface by wind, water, gravity, or a combination of these forces. In the case of water erosion, soil particles are eroded apart by a raindrop or they are picked up in runoff and can be carried to a nearby waterbody. The soil particles that get washed away are called sediment.

Erosion and the off-site damage of the resulting sediment is a serious problem. Not only does sediment clog rivers and streams it also affects the ecological health of all bodies of water. Research demonstrates that sediment blocks the sunlight necessary for aquatic life in lakes and ponds and destroys fish habitat in streams. Sediments can prevent some animals from eating and sediments are also often contaminated with such pollutants as pesticides and heavy metals that can harm wildlife.

Aside from the effects on wildlife, millions of dollars are spent annually to dredge sediment from lakes, ponds, and ditches to maintain their desired function (recreation, drainage, transportation). Also, communities that rely on surface water for their drinking supply must spend large amounts of money simply to have the sediment removed to be fit for drinking. *Taxes, Taxes, Taxes!!! Fees, Fees, Fees!!!*

As with problems in life, prevention is often a much more sensible solution than mitigation. Erosion problems usually increase dramatically with the reduction of surface cover and with steeper slopes. So maintaining adequate surface coverage for a construction site, a crop field, or even your own backyard is key. In agriculture this can be accomplished by utilizing cover crops, no-till planting systems, conservation tillage, or a combination of many other measures. In construction it is important to properly plan the sequence so that the overall disturbance is minimized and if construction activities are idle for any period of time they should be immediately planted with a quick-germinating vegetation such as wheat, rye, oats, or millet.

The Soil and Water Conservation District has natural resource professionals available to help out with these types of situations. Please contact the office with questions or for more information.

- Jerod Chew
Resource Specialist, IDNR

(adapted 7/21/04)

Building a house? Putting on an addition? Where to start?

Check with planning and zoning to be sure of the building code ordinance in the area you wish to build.

If it is a subdivision, check with the sub-division restrictions regarding setbacks, square footage, etc. also some sub-divisions require prior approval from the Homeowner Association.

A place in the country? Check for water, where will the well and/or water supply be located?

Contact the Morgan County Highway Department for a driveway permit if on a county road and the state highway department if you are on a state highway. You will need a driveway inspection and a letter of approval before a building permit can be issued.

Contact the Morgan County Health Department for a septic permit.

Procedures to obtain septic permits in Morgan County:

A soil test must be conducted by a State approved soil scientist (list is available at Health Department).

After the soil report is received the Environmental Health

Specialist enters the information on the computer and prints a condensed report which will be mailed out to the homeowner along with a cover letter explaining the application process. As stated in the cover letter, these items will need to be submitted: **A completed application form**—installers' information on material he will use.

Detailed drawing of the proposed system w/all dimensions and elevations—this is the installer's drawing of what he proposes to install. **Floor plan** (including all levels as well as unfinished basements) from the homeowner. **Plot plan w/dimensions**—show size, or dimensions of lot w/compass direction noted. Also indicate where septic system, house, any other structures, and the well will be located. Show dimensions (footage) from lot lines, waterways, etc. The Homeowner or installer can hand draw this, it doesn't have to be professionally drawn.

Legal description of the property. (A copy of the tax form which the homeowner receives from the treasurer's office will suffice, or usually the legal description is listed on the property deed).

The proposed septic field should be staked (the ends of each trench), along with the house, any other structures and driveway, so that the Health Specialist can perform an on-site inspection.

Once application is made (all paperwork submitted as outlined above) the Health

Specialist will review the paperwork and go to the site for a site inspection. This process is normally conducted within 2—3 working days. If everything is in order, a permit can then be issued. Someone at that time must go to the of Health Department office to pay the fee and sign for the permit.

Before the septic installation, you will need to file an erosion control plan.

If it is less than one (1) acre, the plan will need to be submitted either to the county surveyor, the Mooresville Plan Commission or the Brooklyn Plan Commission. If it is one acre or more, the plan will need to be submitted to the Morgan County SWCD. If you have any questions, please call (765)342-5594 ext. 108. **No earth**

disturbing activities can begin until the plan is approved.

After the septic system is installed completely, the installer should call the Board of Health for a final inspection. * A re-inspection fine is assessed when an installer calls for a final inspection and it isn't ready when the Health Specialist arrives.

**** According to the Morgan County Septic Ordinance all Septic Installers must be registered with the Board of Health before installing systems.**

Contact the Planning Commission for a Building Permit. **Paper work** you will probably need:

Recorded legal description or survey of the property, consisting of section, township and range. Name and lot number if in a subdivision.

Also the name of the road fronting the property.

A parcel number must be obtained from the Morgan County Assessor's Office.

Plot plan showing size of lot and how much road frontage. Show location of proposed building with setback distances from the front, sides, and rear of lot lines, well, septic system, driveway, drainage flow and other existing buildings to assist the inspector in finding the location.

Drainage plan drawing and form.

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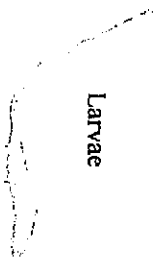
RAT TAILED MAGGOT / HOVER FLY

The rat-tailed maggot is the immature or larval stage of a fly that resembles a honey bee. These 3/4 inch long whitish larvae are different from other fly maggots in having a 1/2 inch long "tail" that is used as a breathing tube when they are in the water.

Large numbers can be present in most any accumulation of **polluted** (nutrient rich) water. These larvae feed on decaying organic matter.

They are a hardy, tough-bodied larvae. The maggots later develop into the Hover Fly or Drone Fly. These adult flies do not bite or sting. They look like honey bees and even pollinate flowers.

Larvae



LITTER LASTS

Thanks to all of you who do not litter, and those who pick up after yourselves **AND OTHERS!** We greatly appreciate the efforts of all Adopt-A-River clean up volunteers for their role in removing refuse from our waterways!

The list below shows how long it takes for items to decay along a roadside. These times don't reflect decomposition in a modern landfill where there is little water, light, or air; and therefore, decomposition is much slower. Modern "garbologists" are finding newspapers that are 40 years old and still legible.

(Source: Refuse Industries, Inc.)

2-4 Weeks	Traffic Ticket
1—5 Months	Cotton Rag
3—14 Months	Rope
1 Year	Wool Sock
13 Years	Painted Wood Stake
100 Years	Tin Can
450 Years	Plastic 6-pack rings
Undetermined	Glass Bottle

Copied from:

Hoosier Riverwatch
Fort Harrison State Park—
NREC
5785 Glenn Road
Indianapolis, IN 46216-1066

MANAGE CROPLAND FOR MORE FISH AND WILDLIFE

Control soil erosion. While soil conservation is basic to all farming systems, if you think about it, covering the soil is as basic for wildlife habitat as it is for soil protection. To have habitat, wildlife must have food and cover, and that's what basic soil conservation practices offer. Grassed waterways, grassed field borders, grass or riparian filter strips, terraces, crop rotations, field and farmstead windbreaks—all these basic practices offer cover and some food to wildlife. In offering soil protection, they also contribute to better water quality.



"When water birds walk across fields the soil follows!"

WILDLIFE WAYS

Did you know.....

Studies have shown no-till fields can produce 9 times the number of bird nests as plowed fields. Riparian buffers at field edges can increase diversity of bird species by five times.

Wildlife Habitat Basics—NRCS

Adult



SITE ASSESSMENT:

Protecting Water Quality Around Your Home

by Alyson McCann, University of Rhode Island
Cooperative Extension

Is your soil sandy or gravelly? Does it drain quickly? Does stormwater runoff from your property flow into a nearby lake or pond? Do you store hazardous chemicals on your homestead, and are they close to a well or next to a lake, stream, or river? This chapter will help you become familiar with your homestead and how you manage it so you can identify risks to water resources. Completing the chapter will provide background information you can use throughout this book. This chapter covers two areas:

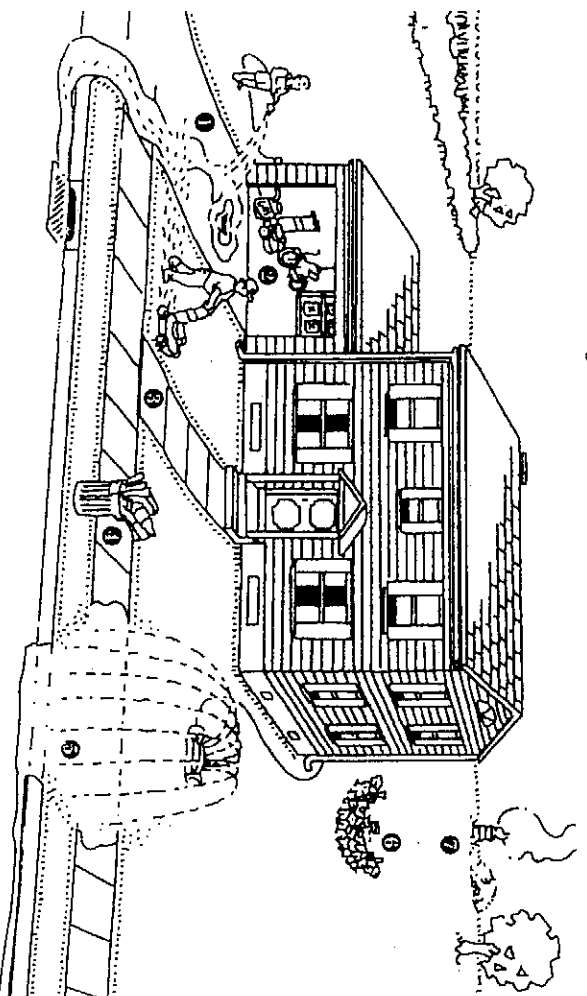
1. *Physical Characteristics of Your Homestead.* Examples of characteristics include soil type and depth; depth to bedrock; depth to the water table; and location of wetlands, streams, or other surface water.
2. *Making a Map of Your Homestead.* A map of your homestead showing buildings, roads, and other constructed or natural features can help you identify potential sources of trouble.

Why should you examine your homestead's physical characteristics and how you manage your home?

What you do in and around your home can affect water quality — both below the ground and in nearby lakes, streams, wetlands, or coastal ponds. This chapter will help you identify some important characteristics of your

homestead such as soil type, geology, depth to groundwater, and nearness to surface water.

It also invites you to draw a simple "aerial view" map of your homestead. Your completed map will show the locations of important features and help you identify activities in and around your home that may pose risks to your health and the environment. Remember—this assessment is a starting point. It is meant to encourage you to complete some, or all, of the other *Home*A*Syst* chapters. To begin thinking about how your activities and site conditions can harm water quality, see figure 1.1 below for some examples of bad practices.



- 1 Washing spilled motor oil and grass clippings into storm drains
- 2 Storing gasoline and other hazardous chemicals near children's toys
- 3 Paving walkways instead of using porous material, thus increasing runoff
- 4 Not separating garbage for recycling
- 5 Improperly adjusting sprinklers - wasting water
- 6 Planting flowers that may require fertilizers and pesticides around the well cap
- 7 Burning garbage, which adds toxins to air that eventually settle on the ground

Figure 1.1 Examples of practices that may harm the environment or home residents.

WATERSHED WALKER II

APRIL 2005



AQUATIC MACROINVERTEBRATE INDICATORS

Macroinvertebrates that live in the streams and rivers are a good indicator of how clean the water supply may be.

Featured Aquatic Insect:

MAYFLIES

Description: The abdomen of the Mayfly Naiad (nymph) is tipped with three hair-like tails. The naiad has a flattened appearance and chewing mouthparts. It is an omnivore and eats algae or hunts for small invertebrates. In turn, the mayfly naiad is preyed upon by fish, frogs, and other aquatic invertebrates.

Habitat: Fast-flowing, oxygen rich streams. Mayflies are an indicator of clean water.

According to scientists, mayflies have survived mostly unchanged for 350 million years.



Mayfly Naiad (Nymph)



The adult only lives a few days just long enough to mate and lay eggs.

Source: AWAKE Plants & Wildlife

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WHY WE SHOULD CARE ABOUT MACRO- INVERTEBRATES

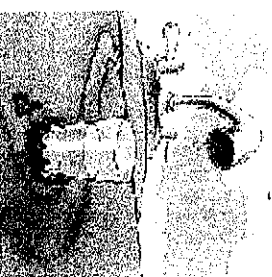
Some scientists call aquatic invertebrates our sentinels. A decrease in the numbers and variety of insects species is the most common result of water pollution. Unless we eat the fish in the water, we are not being directly harmed by water pollution in our rivers and streams, but a decrease in the numbers of "sentinel" insects warn us that we will eventually suffer the same effects. Eventually the same toxins currently entering streams can effect our drinking water.

Also by eliminating insects at the bottom of the food chain, we harm wildlife at the top. Great Blue Heron suffer from a decrease in healthy, insect eating fish. Besides bearing the responsibility of destroying a diverse habitat, we should also be forewarned about our own survival. If the Heron at the top of its food chain is being harmed, we should be alarmed. Perhaps human practices are also harming the food chain which we top. Natural history warns us that habitat that does not have diverse species, collapses.

Source: <http://www.assumption.edu/>

Your Drinking Water Source

You should know the source of your drinking water, and be more aware of human activities that could lead to contamination. Each time you drive by a river, you might think about it as drinking water rather than just "a river." When playing golf near the city's wells, consider how golf course maintenance might affect the water supply. When a new subdivision is proposed near the city's reservoir, you might question its impacts on your drinking water. You might lead an effort to check for failing septic systems in a drinking water protection area.



Do not assume water is safe to drink just because it is clear and tastes good. Most contaminants have no taste, odor, or color. Your assurance that the water is safe should be based on the results of laboratory testing. The water quality report tells you what tests have been done, what levels of contaminants have been detected, and whether the levels detected violate any drinking water standards.

Source: Purdue University WQ-33

What is a watershed?

The water from your tap and in nearby lakes or streams is part of a much larger water system. While not everyone lives next to a pond or stream, we all live in a *watershed* — the land area that contributes water to a specific surface water body, such as a pond, lake, wetland, river, estuary, or bay (figure 1.2). The landscape's hills and valleys define the watershed, or "catchment" area.

A watershed is like a bathtub. The watershed outlet — the mouth of a pond, lake, or river — is the tub's drain. The watershed boundary is the tub's rim. The watershed's drainage system consists of a network of rivers, streams, constructed channels and storm drains, wetlands, and the underlying groundwater.

Common activities — like driving your car or fertilizing your lawn and garden — can affect water quality, even when you do these things far from any shore. By paying careful attention to how you manage activities in and around your home, you can protect your watershed and the water you drink.

What influences the quality of my water?

Understanding the site characteristics of your residence and the location of potential contamination sources are important first steps in safeguarding your water. In the hydrologic cycle, water moves through the air, over land, and through the soil.

Physical characteristics, like soil type, depth to groundwater, and distance to surface water, may hasten or limit a contaminant's effect on water quality.

Water quality is also affected by many activities such as drinking-water well construction and maintenance, pesticide and fertilizer use and storage, septic system maintenance, waste disposal methods, and soil erosion. Animal wastes are another threat to water quality, particularly if large amounts from horses, dogs, or other animals are allowed to accumulate on your property. To protect your water, all of these factors need to be considered.

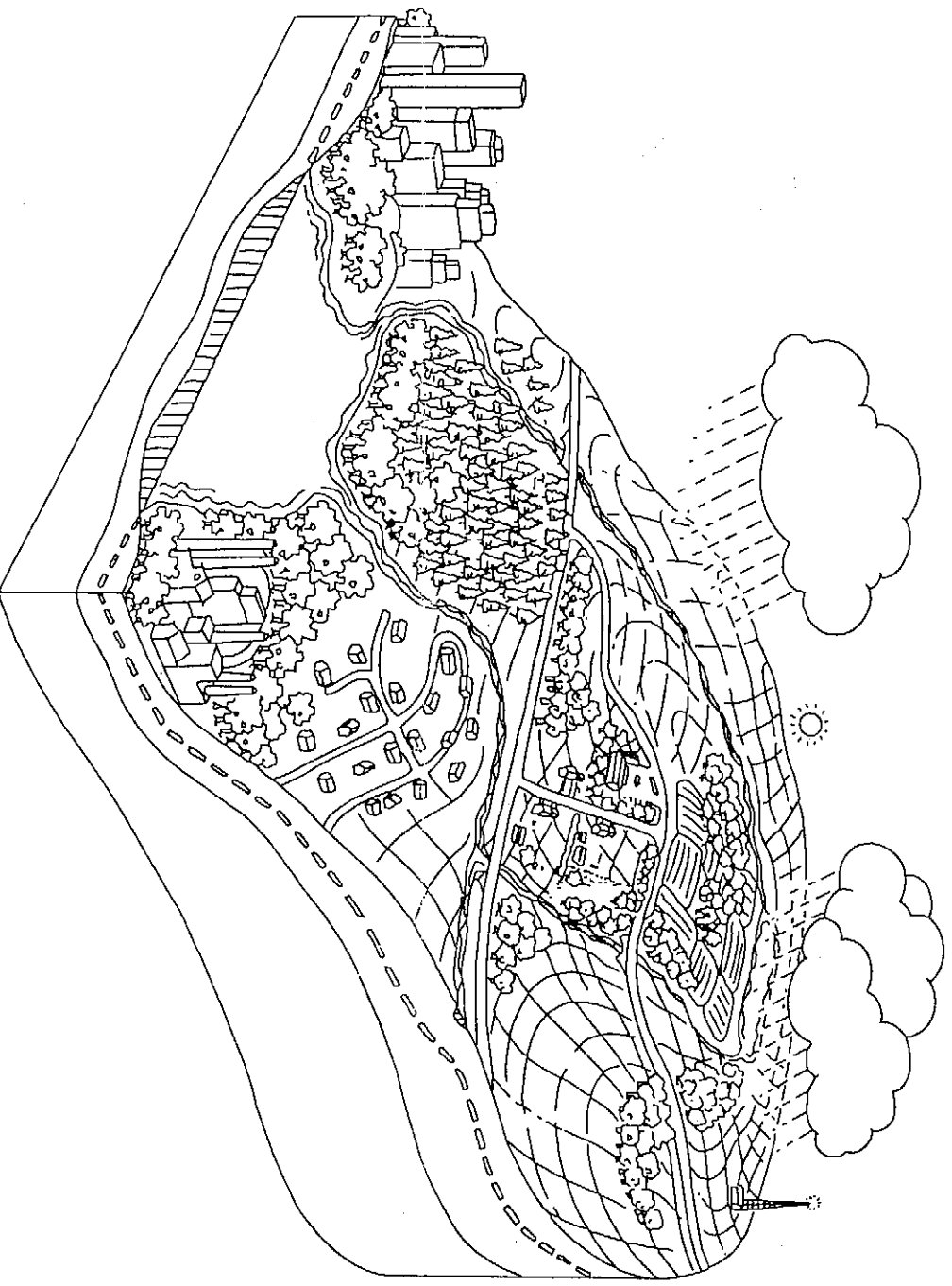


Figure 1.2 A watershed. Activities in the watershed can affect groundwater, stream, and lake quality at lower elevations in the watershed.

WATERSHED WALKER II

JULY 2005



AQUATIC MACROINVERTEBRATE INDICATORS

Macroinvertebrates that live in the streams and rivers are a good indicator of how clean the water supply may be.

Featured Aquatic Insect:

LEECH

Macroinvertebrates are insects without a spine which can be seen without the aid of a hand lens or microscope and are often used as one of the primary indicators of water quality. Lower dissolved oxygen levels are often associated with polluted waters while higher levels indicate good quality water.

Leeches have the feeding strategy of sucking body fluids from other organisms. However, most do not feed on larger animals (like us), but ingest or pierce smaller invertebrates. They have 34 segments to their bodies and a sucker on each end of the underside. Leeches measure 1.0 mm to 5.0 cm in length. They are related to the earthworms. They are commonly found in warm protected waters of lakes, ponds, streams, and marshes. Leeches usually avoid light by hiding under rocks or among aquatic vegetation. Leeches are a sign of polluted water.



Leech

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What you can do to help protect your drinking water.

Sweep, instead of hosing off the driveway, street or sidewalk and collect debris for the trash. Water run-off from driveways or sidewalks carries contaminants, such as dirt, motor oil, fertilizers, and animal waste, through storm drains and into waterways.

Use pesticides and fertilizers sparingly and follow the directions recommended by the manufacturer. Do not apply fertilizers or pesticides before a rain event.

Safely dispose of household cleaners and motor oil. Many automotive and cleaning products found in homes or garages are too dangerous to be disposed of in the trash or down the drain. Products should be recycled or taken to a community hazardous waste center.

Check with the West Central Solid Waste District to see when they hold their Tox-A-Way Days.

Why Make Compost

Compost is one of nature's best mulches and soil amendments, and you can use it instead of commercial fertilizers. Best of all, compost is cheap. You can make it without spending a cent. Using compost improves soil structure, texture, and aeration and increases the soil's water-holding capacity. Compost loosens clay soils and helps sandy soils retain water. Adding compost improves soil fertility and stimulates healthy root development in plants. The organic matter provided in compost provides food for microorganisms, which keeps the soil in a healthy, balanced condition. Nitrogen, potassium, and phosphorus will be produced naturally by the feeding of microorganisms, so few if any soil amendments will need to be added.

Our hands are being forced to deal creatively with our own yard waste, as one by one, cities are refusing to haul off our leaves and grass clippings. Sweeping them into the street and into the storm drain system causes even bigger problems with the rivers and streams and your drinking water. About one third of the space in landfills is taken up with organic waste from our yards and kitchens, just the type of material that can be used in compost.

USED MOTOR OIL COLLECTION FOR RECYCLING:

The West Central Solid Waste District collects up to 55 gallons of motor oil from farmers and do-it-yourselfers at these locations:

Good Year Tire Service Plus

Danville

Energy 24 Plus

Martinsville

Midland Implement

Greencastle

In addition, these locations accept used motor oil for recycling. There is a 5 gallon limit.

Advance Auto Parts

Plainfield (317)839-5707

Mooreville (317)834-0626

Auto Zone

Martinsville (765)349-9530

Plainfield (317)837-8639

Indy Lube

Mooreville (317)831-8432

Plainfield (317)839-0800

NAPA

Five Points (317)831-7402

Mooreville (317)831-7402

Walmart

Martinsville (765)342-4032



Quail feed and roost as a unit in winter, posting a sentry when they feed and facing outward in a circle when they roost. 8 of every 10 bobwhite quail hatched each year will not live to be a year old.

Maximize conservation practices for wildlife

Whether it's in your back yard, on a small acreage, or on a large farm, most soil and water conservation practices you put on your land have some benefit to wildlife. But if you really want to see more wildlife as a result of your conservation work, you need to think about the impact you have on wildlife with every step you take to manage your land. You also need to be sure the conservationist and others you work with know one of your goals is to increase habitat. Case in point: common cool season grasses are often easiest and least expensive to get good ground cover to control soil erosion.

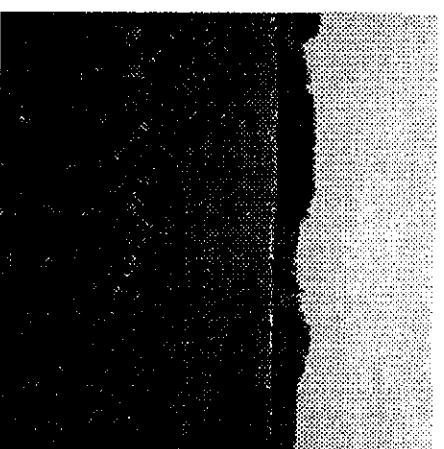
But some cool season grasses have little value to wildlife--a conservationist who knows you have an interest in wildlife will more likely recommend using native plants. The increased cost of using native grasses may be offset by higher rates of cost-share from the federal government, or help from one of a number of local conservation and wildlife groups. To maximize your conservation practices for wildlife:

- 1) Use native grasses and forbs.
- 2) Place wildlife plantings near water.
- 3) Use plants that offer food and important cover for wildlife.
- 4) Use a variety of grasses, trees and shrubs.
- 5) Use farming practices that maintain existing habitat.
- 6) Use maximums rather than minimums for sizes of conservation plantings.

Use grasses, trees and shrubs in conservation buffers and connection corridors between larger habitat areas; use no-till planting for residue cover for small birds in the winter; plant and fence off grasses, trees and shrubs around a farm pond; use more rows, wider and longer, in windbreaks; and plant blocks of native grasses and forbs between wetlands and crop fields to give grassland birds nesting and cold weather cover.

For more information, stop by our office at 1328 Morton Avenue Suite 2 in Martinsville, or visit the NRCS Wildlife Habitat Management Institute's website at www.whmi.nrcs.usda.gov or the NRCS home web site at www.nrcs.usda.gov

By Mike Broadstreet,
District Conservationist, Natural
Resources Conservation Service,
Morgan County.



A grass filter strip helps save soil and improve water, but to maximize for wildlife, expand to a riparian buffer that has multiple rows, mixes plant types and uses natives.

WATERSHED WALKER II

September 2005

CLEAN WATER INDICATORS

CRAZFISH

Description: resemble miniature "lobsters"; possess four pairs of walking legs and a pair of strong pinchers; color can be brown, green, reddish, or black; length up to 6 inches.

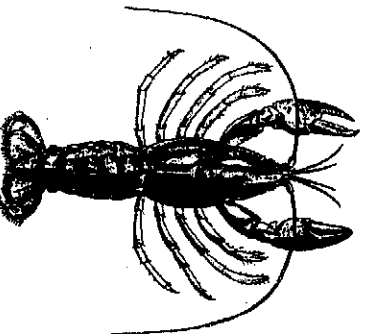
Reproduction: females carry eggs in a mass underneath their tail, which resembles a large "raspberry".

Food: omnivorous, eating plants and animals; pinchers are used for tearing food into edible chunks; crayfish are preyed upon by larger game fish.

Scientific Name: Crustacea
Order: Decapoda

Indicator Role: Indicates moderately clean water, seldom found in polluted waters.

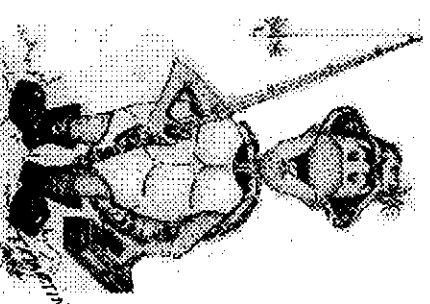
Information Source: McDonald, B., W. Borden, J. Lathrop, 1990. Citizen Stream Monitoring: A Manual for Illinois. Illinois Department of Energy and Natural Resources, ILENR/RE-WR-90/18, Springfield, Illinois.



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The Effects of Pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.



- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into water bodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shell fish or ingesting polluted water.
- Polluted storm water often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Runoff that flows into storm sewers goes directly to streams and lakes without treatment.

